Elements of the Theory of Music

H. J. WRIGHTSON

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ELEMENTS
OF THE
THEORY OF MUSIC

BY

HERBERT J. WRIGHTSON

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ELEMENTS OF THE THEORY OF MUSIC

LESSON I

THE MATERIAL OF MUSIC

1. That part of any subject which is held in the mind and understanding is called **Theory.** The derivation of the word means "a looking at, viewing." So, in music, all the playing, the singing and the composing has a purely mental side, developed by "viewing," considering, learning. It is the foundation of all the rest, and therefore the most important part.

2. Music is a language in sounds, expressing feelings or moods — that kind of thought which cannot be put into words. The sounds are heard in succession as **Melody**, and together as **Harmony**.

The language we speak may be written down and read by others. So it is with music. We write our spoken language by means of letters and words. We write the music language by means of notes, clefs, staves and other signs, which this book will explain in systematic order.

3. First let us think of the sounds themselves, before they are written. We will see that all sounds are not musical sounds. For instance, a knock at the door, or the dropping of a tin cup, are sounds which appear to have no connection with those produced by any kind of musical instrument. A musical sound, or **Tone,** as it is called, has a *definite pitch* as to "high"

or "low." The scientific reason for this will be explained in the Lesson on "Acoustics" (Sec. 93). All we need to notice now is that a sound with a definite pitch is a tone, and can be used in music. Many simple illustrations may be given, such as the bell, the whistle, a note on the piano, striking the edge of a glass gently. The last is a good example, because it will give one pitch (and always the same) when empty, and another when half filled with water. Any tone that you hear can be found (very nearly, if not exactly) on the piano, but you cannot find there a sound corresponding to a knock on the door.

4. **Tones** have four distinct properties — Quality, Loudness, Pitch and Duration.

5. The **Quality** of a tone depends upon the kind of instrument producing it. The tone of a bell can be easily distinguished from that of a whistle, or a bugle, even if of the same pitch. Music for any particular instrument, therefore, will have about the same *quality* of tone throughout. (The organ has many tone qualities because it is really a combination of many separate instruments.) Quality is also called **Timbre,** the French word for the same.

6. **Loudness,** or **Intensity** of tone is caused by the amount of force with which it is sounded; for instance, a steam whistle — very loud on account of the great force of steam; and a violin note softly played — one of the most gentle of all sounds.

7. **Duration.** This is merely the length of time a note is sounded. It may be very brief, or held out for any longer period.

8. **Pitch.** It is easy to distinguish a high-pitched tone from a low-pitched one. Compare notes on the right-hand end of a piano keyboard with those on the left-hand end, or the shrill factory whistle with the deep steamboat fog-horn. The siren whistle produces a tone sliding rapidly from low to high and down again.

EXAMINATION QUESTIONS

1. What is meant by Theory?
2. How may music be compared to language?
3. By what means is music written down?
4. What kind of sounds are used in music?
5. Give examples of musical sounds.
6. What are the four properties of tones?
7. Explain each, giving examples.
8. What is Timbre?

LESSON II

NOTATION

9. **Notation.** The writing down of musical ideas, consisting of tones, sounding one after the other, or together, or both, by various signs already mentioned, is called **Notation.**

As Quality is fixed by the instrument for which the music is arranged, — Piano, Violin, Flute, etc., and loudness is indicated by the initial letters of certain Italian words, or sometimes by plain English words, the term Notation applies, in general, to the signs for the other two properties — Duration and Pitch.

10. **Notes,** showing duration. The length of time a tone is to sound is indicated by the *shape* of the note standing for that tone. The "longest note" in general use at the present time, that is, the note representing the longest duration, is the **Whole-Note,** an egg-shaped note with no stem, 𝅝. The **Half-Note** is, as its name indicates, of half the duration, and its sign is 𝅗𝅥. The **Quarter-Note** and all shorter notes, have solid heads, and are distinguished from each other by their stems. The **Quarter-Note** has a plain stem (♩), the **Eighth-Note** has one "hook" or "flag" added (♪), the **Sixteenth-Note** has two hooks (𝅘𝅥𝅯), and so on, each addition of a hook halving the length of the note.

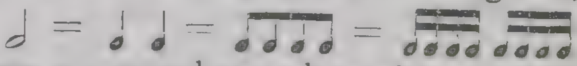
To illustrate the relation of these notes to one another: — Supposing that you walk along, and let each step represent a quarter-note: by clapping the hands twice to each step, the hands will be beating eighth-notes, while the feet are stepping quarter-notes. If you clap four times to each step, you are then beating sixteenth-notes with the hands; and to get half-notes you must clap only once for every two steps, that is, each time your right foot comes down, for instance.

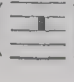
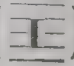
11. **Rests.** There is a sign called a rest corresponding to each note and indicating a period of silence, of duration equal to the note.

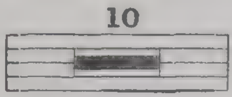
TABLE OF THE NOTES AND THEIR CORRESPONDING RESTS

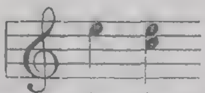
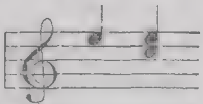
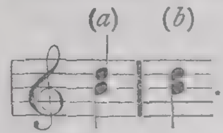
Note		Name	Rest	
𝅝	=	Whole	𝄻	(under a line)
𝅗𝅥	=	Half	𝄼	(on line)
♩	=	Quarter	𝄽	(other forms 𝄽 𝄾)
♪	=	Eighth	𝄾	
𝅘𝅥𝅯	=	Sixteenth	𝄿	

Each of these is half as long as the one before it, or twice as long as the one after it. Further fractional divisions of the sixteenth-note may be made, into **Thirty-seconds**, or even **Sixty-fourths**, by adding hooks, but shorter notes than thirty-seconds are seldom seen.

A half-note will equal in duration two quarters, four eighths, or eight sixteenths, etc.  The hooks or flags are often run together, as here shown, when there are several notes of the same kind.

The Whole-note Rest is also used for a **Whole Measure Rest**, no matter what that measure's length. There are other rests for two measures () and four measures (), which, however, are not often used, as a rest of several measures' duration is generally printed with the measures in full, a Whole-note rest in each. If of very long duration, a sign, with the number of measures printed above, is used; thus:—



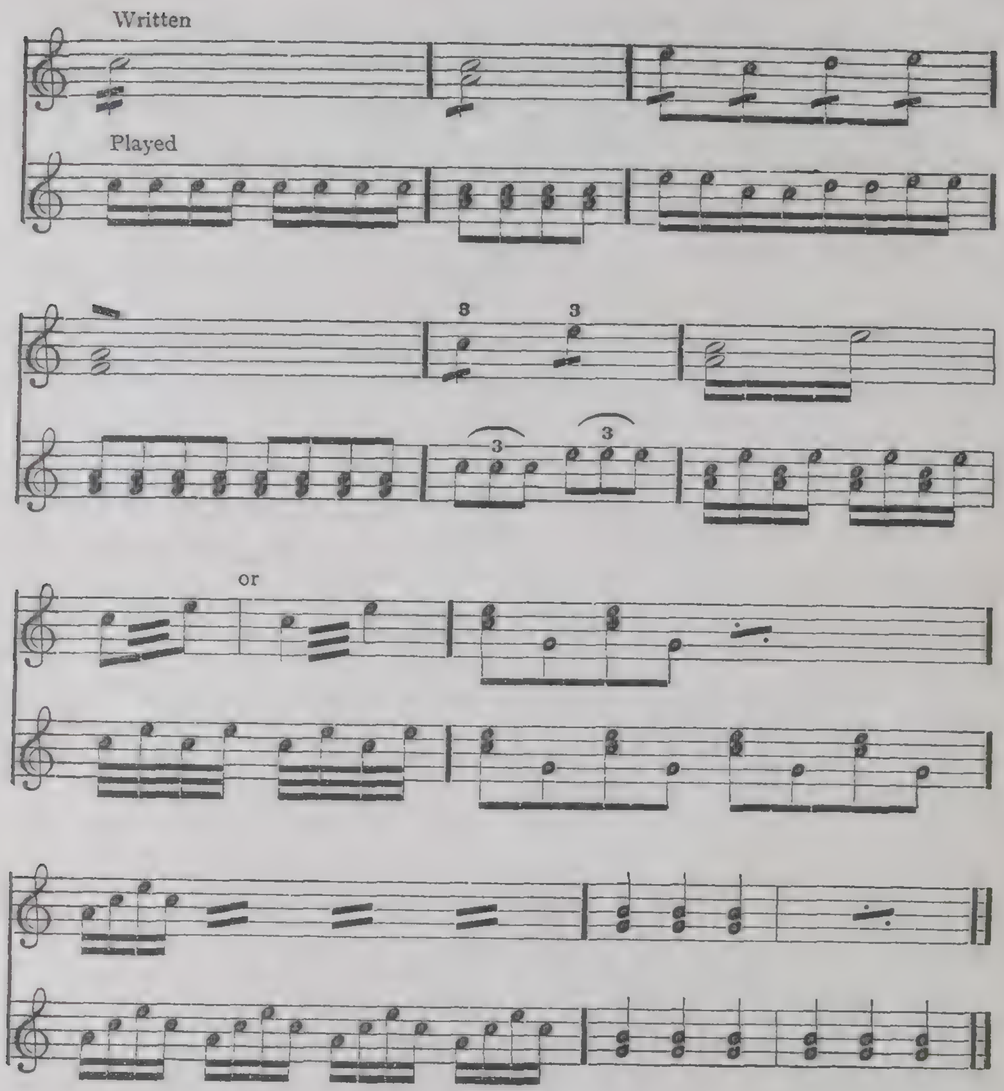
12. The stems are sometimes turned upward and sometimes downward. They are turned in the direction that will keep them most on the staff,  not  unless two different voices are to be indicated, when stems turned in opposite directions are used . At (*a*) is the proper notation for two voices, such as soprano and alto; at (*b*) the notation for piano but also used for voices in an inferior style of printing, or very simple music.

13. **Tie.** Two notes connected by a Tie (𝅗𝅥⁀𝅗𝅥) are exactly the same as one note of the value of the two taken together, 𝅗𝅥⁀𝅗𝅥 = 𝅝 that is, the second is not sounded again but held in continuation of the first.

14. **Dot.** A dot placed after a note means that it is to be made half as long again: ♩. = ♩⁀♪   𝅗𝅥. = 𝅗𝅥⁀♩

Sometimes a note is double-dotted. The second dot adds half the value of the first dot; e. g., 𝅗𝅥.. = 𝅗𝅥⁀♩⁀♪ A rest, as well as a note, may be lengthened by a dot. 𝄽· = 𝄽 𝄾 The two rests are, however, preferable.

15. **Abbreviations of Notation.** There is a "musical shorthand" occasionally employed to save time and labor in engraving or writing, though more often the latter, as the representation of a passage in full is generally to be preferred in print. The principal abbreviations are as follows:—



EXAMINATION QUESTIONS

1. What name is given to the signs by which music is written down?

2. By what means is the duration of a tone indicated?

3. Describe the different kinds of notes.

4. How many eighth-notes equal a whole-note in time value?

5. Describe an exercise comparing longer and shorter notes by walking and clapping the hands together.

6. Mention two different ways of writing eighth- and sixteenth-notes.
7. Which way should the stems be turned?
8. What is a tie?
9. What is the meaning of a dot after a note?
10. Explain rests.
11. When are abbreviations of Notation used? Give some examples.

LESSON III

NOTATION (Continued)

16. **Older Names and Notes.** The notes have other names, but these are less used now than formerly, as their fractional names (quarter, half, etc.,) are more practical in every way. These are as follows:—

Whole-note 𝅝 = Semibreve
Half-note 𝅗𝅥 = Minim
Quarter-note ♩ = Crotchet
Eighth-note ♪ = Quaver
Sixteenth-note 𝅘𝅥𝅯 = Semi-quaver
Thirty-second-note 𝅘𝅥𝅰 = Demi-semi-quaver

The prefix "semi-" means "half"—semi-quaver = half-quaver. The semibreve or whole-note was originally half of a note called a Breve. Though rarely met with, its sign is 𝅜 and its name, "Double Whole-note." The word Breve itself means "brief" or short, and when notes were first invented the Breve was one of the shortest notes, but the longer ones are not used at all in our music.

The prefix "demi-" means the same as "semi-," and so the half-sixteenth note, or thirty-second note, is called a demi-semi-quaver, and the sixty-fourth note a semi-demi-semiquaver. The inconvenience of these names is very apparent here.

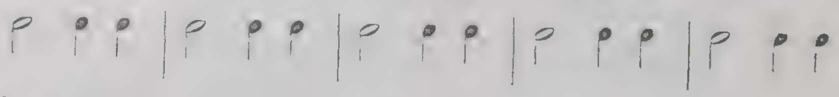
EXAMINATION QUESTIONS

1. Give the older names for the notes.
2. Why is the Whole-note called a Semibreve?
3. What indication does this give that long notes were originally in general use?
4. How would a shorter note than a semiquaver be named?

LESSON IV

METRICAL RHYTHM, MEASURE, "TIME"

17. One of the most important qualities of all music is the **Rhythm** — the arrangement of long and short notes in a certain pattern that keeps repeating, and is easily recognized. Let us suppose this arrangement is taken, 𝅗𝅥 ♩ ♩ and repeated several times, or many times:



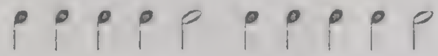
We would have a certain Rhythm.

18. **Illustration.** In order to try the effect, walk briskly along as directed in Sec. 10, letting the steps represent quarter-notes, and clapping the hands for the notes above. Each similar group equals four quarter-notes in duration, but begins with a two-beat note.

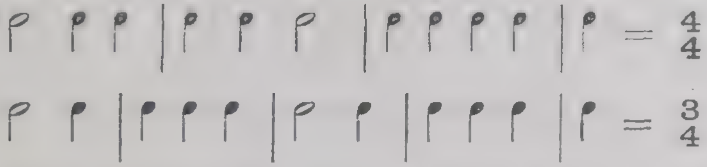
19. **Bar-lines.** We divide the groups by vertical lines, called **Bar-lines**, and place at the beginning the sign $\frac{4}{4}$, the lower figure showing the kind of note taken as a unit of counting or stepping (quarter-note) and the upper the number in each section. These sections are properly called **Measures**, but sometimes called **Bars**. The sign $\frac{4}{4}$ is called the sign of the **Meter** (also variously called "Time Signature," "Time Sign" and "Measure," in the confused terminology of music which it should be our endeavor to correct). The first note of each group — that is, the first one after each Bar-line, re-

ceives an accent, which makes plain to the ear the Meter, or metrical divisions.

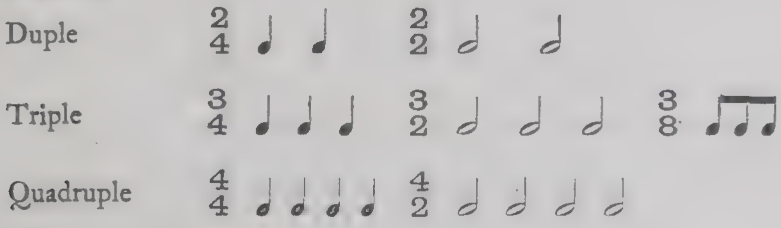
For example, these notes heard in exact duration but without accent would give no idea of meter: —



The indication of accents on certain notes, by placing bars at regular time distances, will give, *with the same notes*, either $\frac{4}{4}$ or $\frac{3}{4}$ Meter: —



20. There are many different Meters in use, such as $\frac{4}{4}$, $\frac{3}{4}$, $\frac{2}{4}$, $\frac{6}{8}$, $\frac{9}{8}$, $\frac{12}{8}$, $\frac{3}{2}$, $\frac{4}{2}$. The explanation of all is the same. The upper figure shows how many there are in each measure of the notes indicated by the lower figure, and consequently shows how many counts (steps or beats) to make in a measure. Two beats to a measure is called **Duple Meter** (Time, or Measure), three beats, **Triple Meter**, and four beats, **Quadruple Meter.**

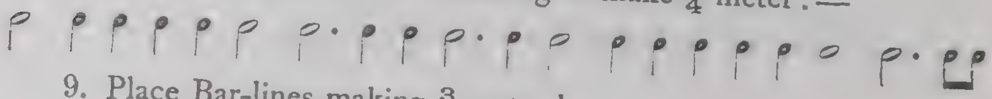


EXAMINATION QUESTIONS

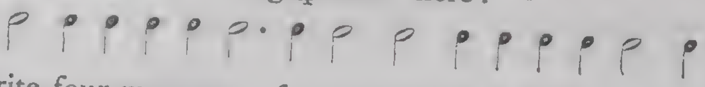
1. What is one of the most important features in music?
2. Explain how it forms the Measure, or Meter.
3. How are the Bar-lines used?
4. What connection is there between Bar-lines and accent?
5. What makes the Meter $\frac{3}{4}$ or $\frac{4}{4}$, etc.?
6. What is the meaning of these signs?

7. How is the term "Bar" sometimes used to mean something else than the bar-line?

8. Place Bar-lines in the following to make $\frac{4}{4}$ meter:—



9. Place Bar-lines making $\frac{3}{4}$ meter here:—



10. Write four measures of notes, giving $\frac{2}{4}$ meter.

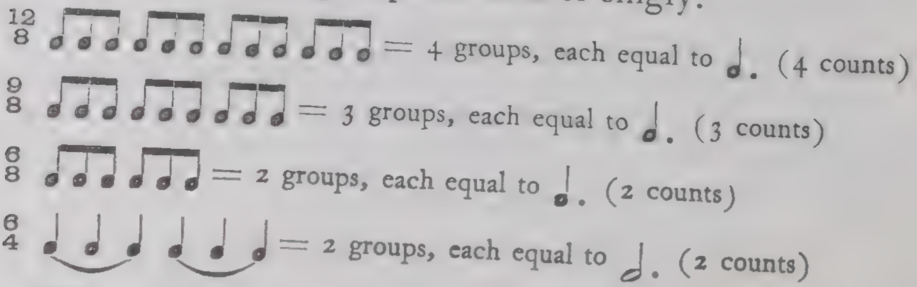
11. Define Duple, Triple and Quadruple meter.

12. Give example of each variety.

LESSON V

SIMPLE AND COMPOUND METER

21. Simple and Compound Meter. When there are many short notes in each measure, as with $\frac{9}{8}$ or $\frac{12}{8}$ meter, they are usually counted in groups instead of singly.



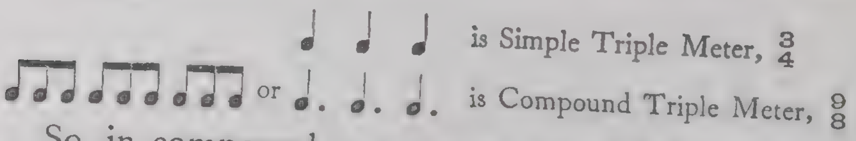
$\frac{12}{8}$ = 4 groups, each equal to ♩. (4 counts)

$\frac{9}{8}$ = 3 groups, each equal to ♩. (3 counts)

$\frac{6}{8}$ = 2 groups, each equal to ♩. (2 counts)

$\frac{6}{4}$ = 2 groups, each equal to 𝅗𝅥. (2 counts)

When three notes are taken together and counted as one beat, we have Compound Meter, and it is Quadruple, Triple or Duple Compound according to whether there are 4, 3, or 2 counts.

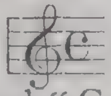
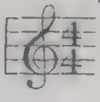


is Simple Triple Meter, $\frac{3}{4}$

or

is Compound Triple Meter, $\frac{9}{8}$

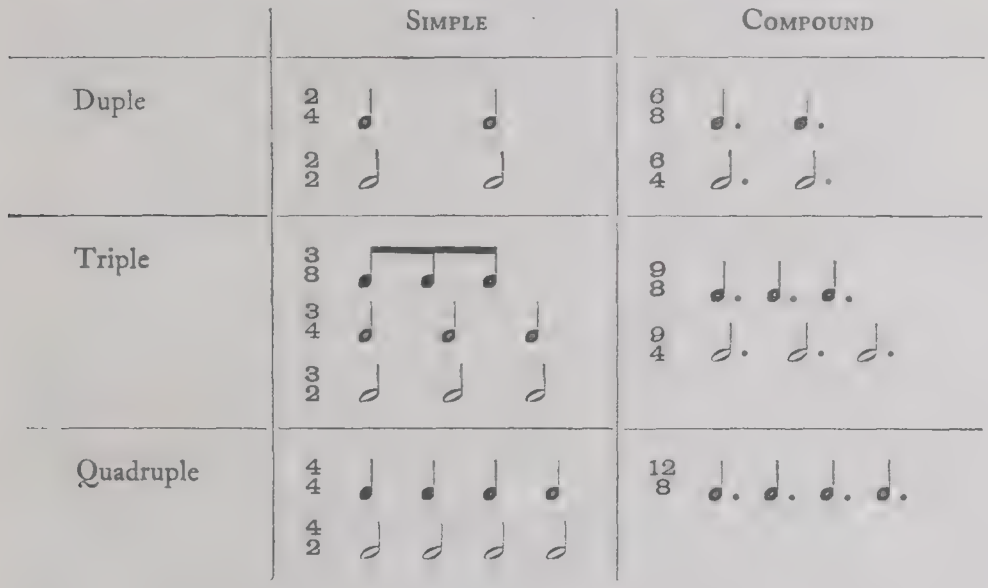
So, in compound meter, *each beat* (or count) *has the value of a dotted note.* In $\frac{6}{8}$ meter one may count six eighth notes; but two counts of three eighths each is generally more convenient.

22. "Common Time" is a common but generally misunderstood term. Its sign is  and means  but the C does not stand for the word "Common."

In the early days of music, triple meter was considered Perfect (compared with the Trinity) and was represented by a circle. When Quadruple meter was used, it was considered imperfect and the circle was broken, thus C. This is the origin of the "Common Meter" sign.

A line through the 𝄴, thus 𝄵, changes $\frac{4}{4}$ into $\frac{2}{2}$, that is, it makes the half-note the beat instead of the quarter. This meter is called **Alla Breve**, having originally a Breve (Sec. 16) to the measure. It is still sometimes used for four half-notes to the measure, that is, $\frac{4}{2}$ meter.

23. A diagram of the usual meters is here given:—



EXAMINATION QUESTIONS

1. What is the difference between Simple and Compound Meter?
2. What feature is common to all Compound Meters?
3. What is the origin of the sign known as "Common Time"?

4. When a vertical line runs through the 𝄵, what does it indicate?

5. Write a short example of $\genfrac{}{}{0pt}{}{6}{8}$ meter, using several different kinds of notes.

6. The same with $\genfrac{}{}{0pt}{}{9}{4}$ meter.

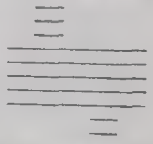
7. The same with $\genfrac{}{}{0pt}{}{12}{8}$ meter.

8. Write an example which can, with the same notes, be either $\genfrac{}{}{0pt}{}{6}{8}$ or $\genfrac{}{}{0pt}{}{9}{8}$ according to the placing of the bars.

LESSON VI

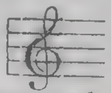
THE STAFF AND CLEFS FOR PITCH

24. **The Staff.** In order to show whether a written sound is high or low, and also its exact pitch, the Staff is used — five lines like the steps of a ladder . The higher the pitch of the note, the higher it is placed on the staff. If the note is higher than the top line of the staff, or lower than the bottom line, a kind of extension is made by adding other short lines, just long enough to hold the note, and spaced just like the regular lines of the staff. These little lines are called **Leger** or **Added Lines.**

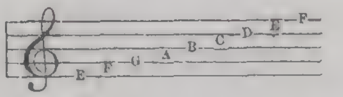


25. Tones are named, as to pitch, by the first seven letters of the alphabet, A to G, because there are seven degrees used in our scale. The eighth degree is a duplicate of the first, at what is called an "octave" higher. The white keys of a piano are thus named A, B, C, D, E, F, G, A, B, C, and so on, throughout the whole length of the keyboard.

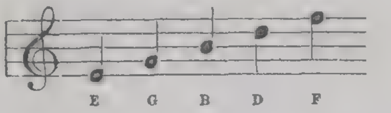
26. **Clefs.** In order to give a particular letter name to each line and space of the Staff, a **Clef** must be used. This is a sign placed at the beginning of each Staff.

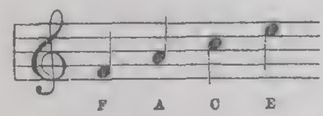
27. The **Treble** or **G Clef**  is said to be placed upon the second line. It winds around that line, crossing it four

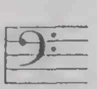
times, and the second line is then G — not any G but a certain one near the middle of the piano keyboard. When this is G, the names of all the other lines and spaces are fixed:—

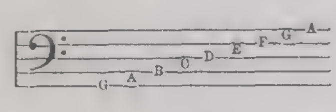


Dividing these Lines and Spaces, they are: —

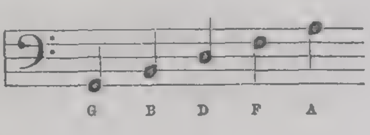


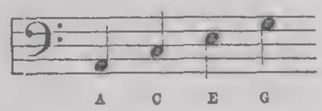


28. The **Bass** or **F Clef**  makes the fourth line of a staff F, and all the other lines and spaces accordingly: —



Dividing these into Lines and Spaces, they are: —



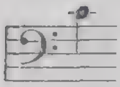
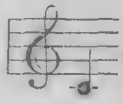


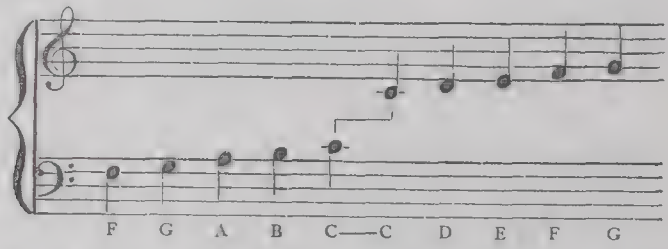
EXAMINATION QUESTIONS

1. What is the Staff?
2. How does it show whether a tone is higher or lower?
3. Can the absolute pitch of a tone be indicated by the staff alone?
4. How is the staff extended for notes above or below its range?
5. How are tones named to distinguish one from another?
6. What is the Clef?
7. What clefs are explained in this Lesson?
8. How is the pitch of a tone fixed by the use of staff and clef together?
9. Explain the Treble clef, naming lines and spaces.
10. Explain the Bass clef, naming lines and spaces.

LESSON VII

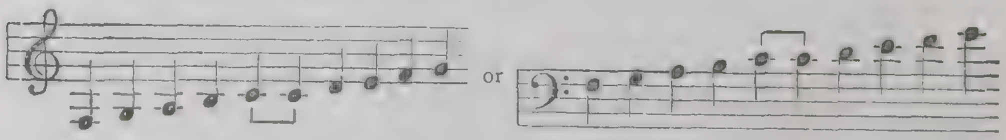
CLEFS (Continued)

29. The first leger line above the Bass clef will be **C**  and the first leger line below the Treble clef is the same C  so that a tone beyond the range of the one will run on to the other; and the two staves, bracketed together with a **Brace**, form the score used for Piano, Organ, Harp, etc., where music of extended range is played by both hands at once: —

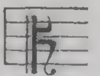


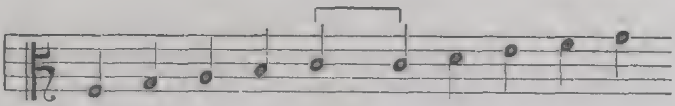
It is here shown how a gradually ascending succession of tones may be written running from the bass to the treble clef. The two C's represent the same tone, and are the same key on the keyboard. It is called "**Middle C,**" being in the middle between the G and F clefs, as well as in the middle of the keyboard.

The above succession of tones could be written on the Treble clef alone, or on the Bass clef alone, by using leger lines where they go beyond the staff: —

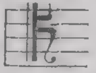


30. **Middle C** is of such importance on account of its central location that it has a clef sign of its own, called simply

the **C Clef.** This is not very frequently met with in modern music but is still used for certain orchestral instruments. When found on the middle line of a staff  the notation of a passage corresponding to the above illustration would be:—



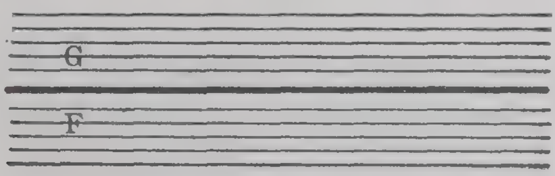
In this position it forms what is called the Alto staff.

For a few instruments another use of the C clef is made, in which it is located on the fourth line:—  This is called the Tenor staff. The same "middle C" is indicated, but it takes in only one line above the C line, and three below.

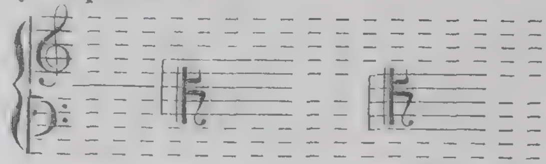
On account of these different forms of C staff the misunderstanding has arisen that the C clef is a movable one, making C wherever placed. The fact is that (as shown in the next Section) it always stands on the Middle-C line, in its classical use, whether that line be the third or the fourth of a five-line staff.

31. From the explanation given of the staff and clefs, it will be plain that the staff of five lines, alone, can give no idea of pitch, the clef sign being necessary for that purpose.

The staff is, in fact, only a selection taken from a **Grand Staff** of eleven lines, once in use for notation; thus:—



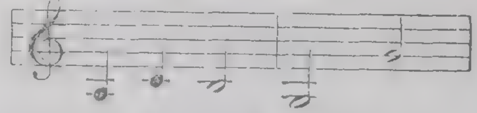
The thick line in the middle was C, the second above it being G, and the second below it, F. These three pitches are indicated by the three clefs described, and the Grand Staff is now broken up and used only in groups of five lines at a time, as already explained: —



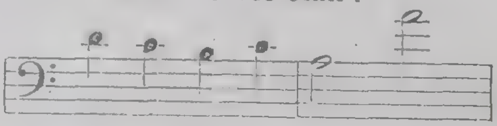
It will be seen that the treble clef takes the top five lines; the bass clef the bottom five; and the C clefs, the five in the middle for Alto; and for Tenor another five a little lower, as being more convenient for the notation of lower tones. Other forms of the C clef sign are in use, as . They have identically the same function, that of indicating the Middle C line.

EXAMINATION QUESTIONS

1. Why are treble and bass clefs conveniently used together?
2. For what kind of music are they so used?
3. What is a Brace?
4. What is Middle C?
5. Write these notes on the bass staff: —



6. Write these notes on the treble staff: —



7. What is the Grand Staff?
8. Why is Middle C used as the third line for alto and as the fourth for tenor?

LESSON VIII

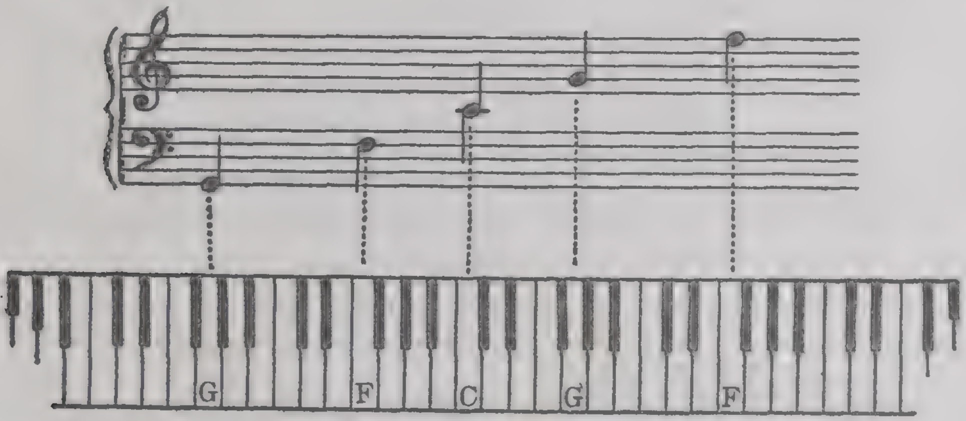
THE KEYBOARD

32. **The Keyboard** of a Piano has white keys for all the notes on the lines and spaces of the Staves, and black keys for the tones which in some places fall between those sounded by

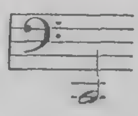
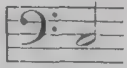
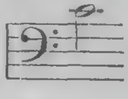
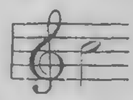
adjacent white ones. The change in pitch in moving from B to C is less than in moving from C to D. By looking at the picture of the keyboard you will see that there is no black key between B and C, but there is one between C and D. From any key on the Piano to the next, whether white or black, is the tonal distance of a **Half-step.** From C to D is, then, two half-steps, or a **Whole-step.** In only two places on the keyboard are there half-steps between white keys — between B and C, and between E and F; repeated, of course, in every octave. The Keyboard of a modern piano has seven octaves, A to A, and three more keys at the high end, taking the range up to C.

33. The term "Semitone" for Half-step is incorrect. We can have a tone, which is a sound, but can hardly have "half a tone." The error arises in calling a whole-step a "Tone," or a "whole tone." It is desirable to make our terminology precise and clear as to meaning.

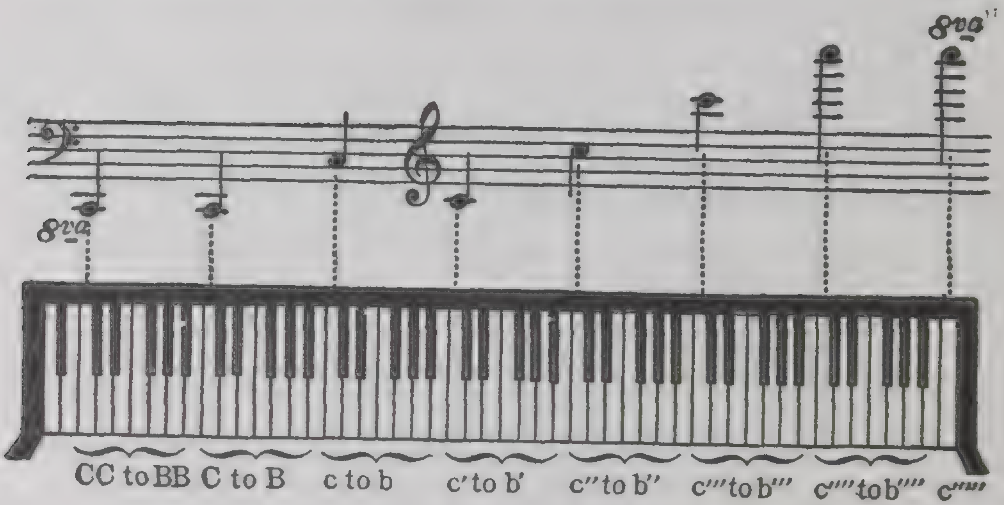
34. The relation between the keyboard and the treble and bass clefs used for piano music may be seen in the diagram below: —



35. In order to denote the pitch of any tone without a Staff, the following **Tablature** system is used. The C below

the bass clef  is called "Great C," and written with a capital letter (C). The C above, or  is "Small C," (c); Middle C is "One-lined C"— (c′); the next one higher,  is "Two-lined C" or c″, and so on. The octave below Great C is the Double-great octave.

The following diagram makes the matter clear:—

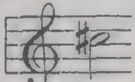
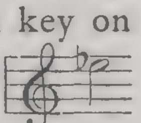


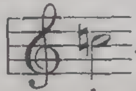
EXAMINATION QUESTIONS

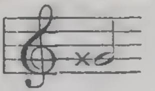
1. What do the white and black keys of the keyboard represent?
2. What is the tonal distance from one white key to the next?
3. What is a Half-step?
4. Are there any black keys a half-step apart?
5. How many octaves are there on the piano keyboard?
6. Where is Middle C found?
7. What would be the "two-lined octave?"
8. What other terms are incorrectly used for "Step" and "Half-step"?

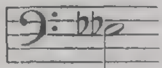
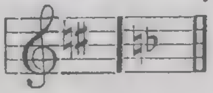
LESSON IX

SHARPS AND FLATS

36. **Sharps and Flats** indicate tones a half-step higher or lower than the plain note would show;  or "C-sharp," is a half-step higher than C, and would be the black key on the keyboard between C and D. In the same way,  "E-flat," would be the black key lower than (to the left of) E. D-flat and C-sharp are thus the same on the keyboard. The next key below C being a white one, C-flat is the same as B; and E-sharp is the same as F.

If a note has been "flatted" or "sharped" and it is desired to have it as at first, a **Natural** sign is used (sometimes called a "Cancel") . It is therefore said that the white keys are the naturals, but you will notice they are occasionally sharps and flats. Naturals are always white keys, however.

37. If a note is to be raised two half-steps, we have the **Double-Sharp** sign: —  G-Double-sharp is the same as A on the keyboard.

The **Double-flat** represents a tone two half-steps lower. E-double-flat  is the same as D on the keyboard. The contradiction of a double-sharp or double-flat is by a single sharp or flat, or sometimes these signs 

EXAMINATION QUESTIONS

1. What are Sharps and Flats?
2. What keys on the keyboard are used for these?

3. What is a Natural?
4. For what purpose are Double-sharps and Double-flats?

LESSON X

SCALES

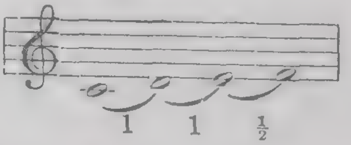
Major Scales

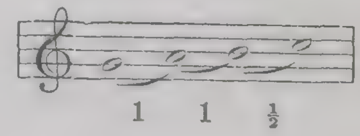
38. **Scale** means "a ladder," and a passing up and down the tones, step by step. Beginning on any white key of the piano and going up by steps to the same letter in the next octave we get a succession of sounds, some of which are a half-step apart, and some a whole-step. This is because, as we have seen, there are half-steps at only certain points on the white keys. When we begin and end on C's we get what is called the natural **Major Scale.** Being the only one in which all the notes are on the white keys of the instrument, it is the only one not requiring any sharps or flats in notation. Of the eight degrees to the octave

C	D	E	F	G	A	B	C
I	II	III	IV	V	VI	VII	VIII

there are half-steps between Nos. III and IV, and between Nos. VII and VIII. At other places are whole-steps.

39. Dividing this scale into groups of four tones each, called **Tetrachords**, we shall see that they are similar as to the positions of half- and whole-steps: —





40. **Sharp keys.** When we begin on G and remain on the white keys, we shall get the half-step between III and IV, but not between VII and VIII, and must use the black key, F-

sharp, to obtain the half-step at that point. This is why the scale of G has one sharp. *The scale beginning on the Dominant (fifth above) always has one more sharp.* The scale beginning on the dominant of G, that is, the D scale, will require two sharps, and so on through what is called the **Circle of Fifths** upwards:

C major	(Natural key)
G “	has one sharp
D “	has two sharps
A “	“ three “
E “	“ four “
B “	“ five “
F♯ “	“ six “
C♯ “	“ seven “

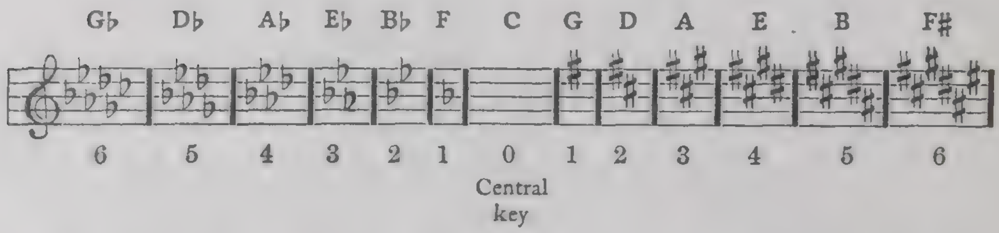
In C-sharp major every degree of the scale is sharpened; so that if we continued any further we should require double-sharps, and such scales are unnecessary.

41. **Flat keys.** If we proceed by the circle of fifths downwards, that is, by subdominants, a fifth below each time, we shall require to add flats. Beginning on F, a flat will have to be added (to B) in order to get the half-step between III and IV. The subdominant of F is B-flat, and the B-flat scale requires two flats, and so on. *The scale beginning on the Subdominant (fifth below) always has one more flat.*

C major	(Natural key)
F “	has one flat
B-flat major	has two flats
E-flat “	“ three “
A-flat “	“ four “
D-flat “	“ five “
G-flat “	“ six “
C-flat “	“ seven “

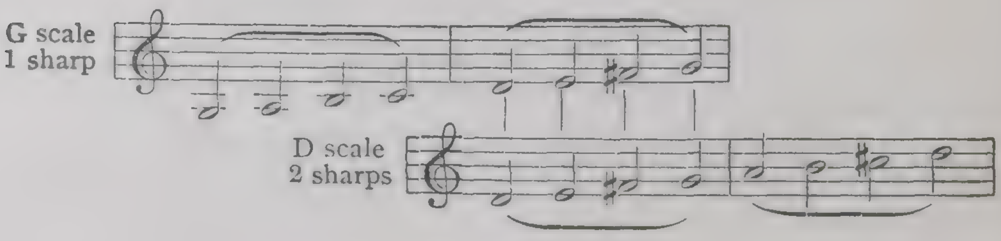
42. The scale sharps or flats are called the **Key Signature.** They are placed in a group at the beginning of the staff, next to the clef sign, and before the Meter sign. They are also repeated on every staff through the piece, while the meter is not. Sharps or flats used as required in the course of the music are called **Accidentals,** and only apply to the measure in which they occur, although a natural is often used in a later measure to remove more definitely the mental effect of a sharp or flat which has been introduced.

KEY SIGNATURES

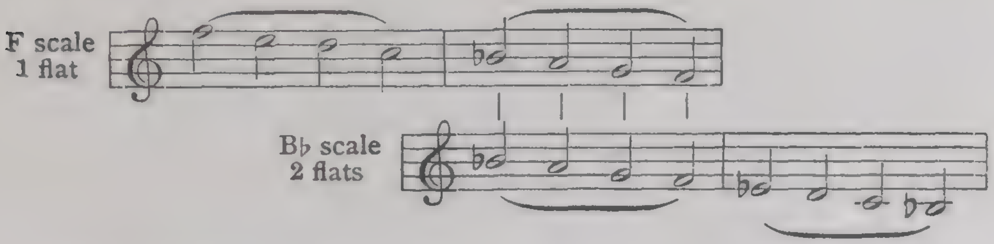


43. The keys at the opposite ends of this Table are the same (on the keyboard) F♯ being the same as G♭. There are six sharps in the one, and six flats in the other. These numbers added together make twelve, and this is always the case with two keys, one in sharps and the other in flats, which are the same on the keyboard. They are called **Enharmonic Equivalents.** (Compare D♭ and C♯; also B and C♭.)

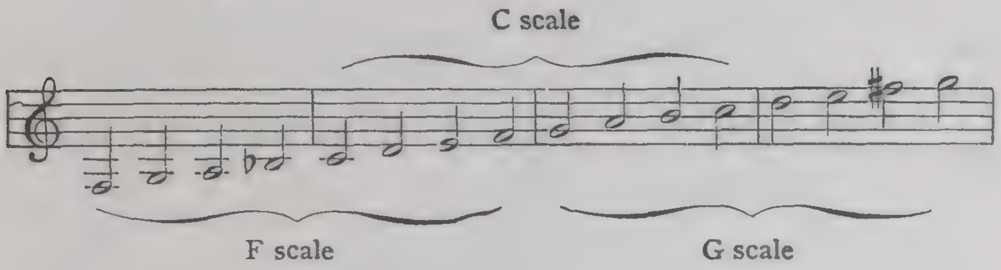
44. In Sec. 39 the Tetrachord was explained. It will now be seen that the upper tetrachord of each scale becomes the lower one of the next scale in the Circle of Fifths, ascending: —



Reversing this, the lower tetrachord of any scale is the upper one of the next scale in the Circle of Fifths, descending — that is, on the Flat side: —



Illustrating both at once: —



EXAMINATION QUESTIONS

1. What is a scale?
2. What is the Natural Major Scale, and why is it so called?
3. Describe the construction of a major scale.
4. What is a Tetrachord?
5. Why are sharps and flats required for the scales?
6. What is a Key Signature?
7. Where is it found in printed or written music?
8. What are accidentals?
9. State what you know concerning keys enharmonically the same.
10. Illustrate in notation the tetrachord in common between two scales in flats.
11. The same between two scales in sharps.
12. What tetrachord is common to a flat and a sharp scale?

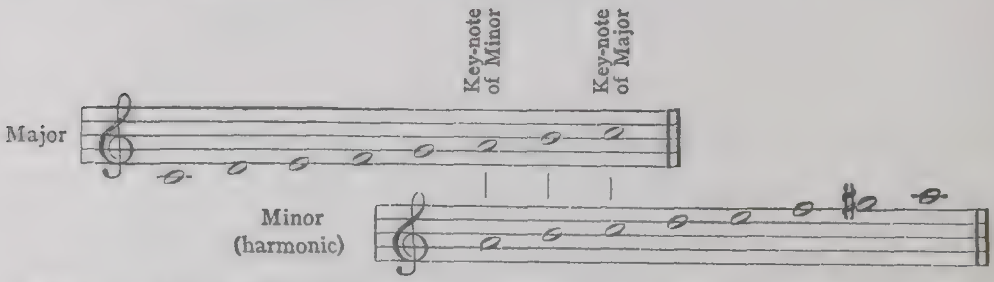
LESSON XI

SCALES (Continued)

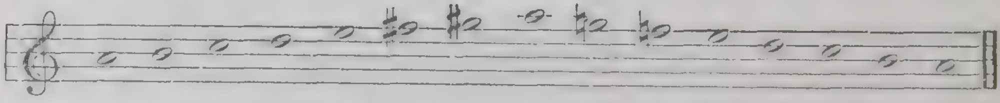
Minor Scales

45. **Minor Scales.** There are two kinds of Minor Scales in general use, the **Harmonic** and the **Melodic.** Every major scale has a **Relative Minor,** which uses the *same key signature,* and most of the same tones, but has the *Sixth of the major* for a key-note.

46. The two relative scales overlap for three notes, and when we have a minor scale, its third will be the key-note of the **Relative Major.** In other words, the key-notes or tonics of Relative or "Parallel" major and minor are a third apart, with the major above: —

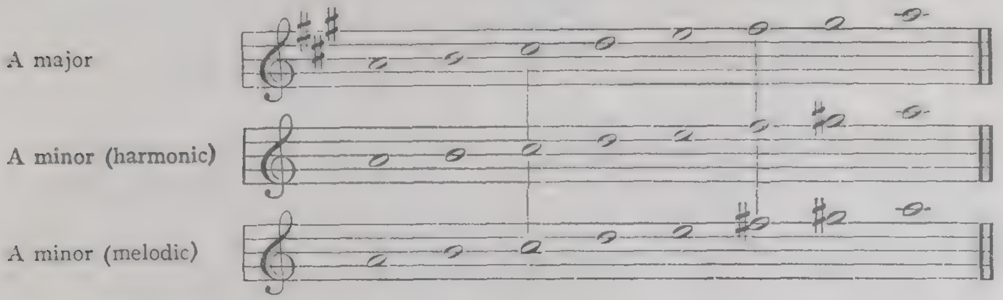


The only difference between these two is the G-sharp which is used to make a half-step progression to the upper key-note in the minor scale, this being more satisfactory to the ear. The raising of G to G-sharp causes a gap of three half-steps from the F below it, and as this is unmelodic, the **Melodic Minor** has another change to avoid that interval — raising the sixth: —



In the Melodic Minor both of these sharps are omitted in descending, but the Harmonic Minor is the same up and down, and is the basis of almost all chord construction, or Harmony. Both are equally the Relative Minors of the same major scale — C.

47. Comparing this A minor scale with the major scale of A, some differences will be noticed. The most important is the third — C-natural instead of C-sharp : —



From I to III in minor is a smaller interval than from I to III in major, and hence the name "minor" meaning less.

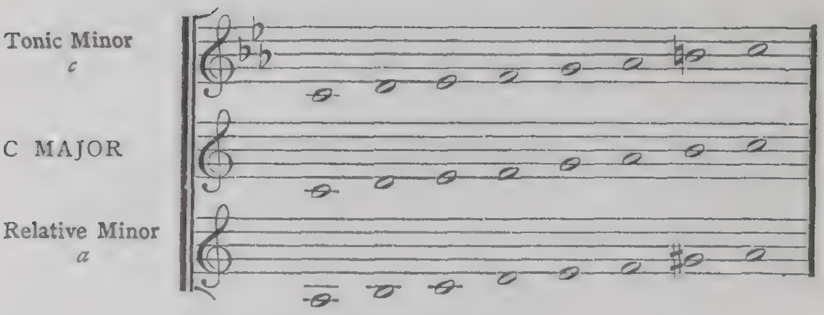
48. A minor and C major are relative scales, but A minor and A major are not related, excepting that they begin on the same key-note. The one is called the "**Tonic Minor**" or "**Tonic Major**" of the other, tonic meaning key-note. Major and minor scales are called **Diatonic.** They consist of steps and half-steps in definite arrangement. The term **Mode** is also applied here, as Major Mode, Minor Mode.

For reference we add here a complete Table of Scales, with the Tonic and Relative Minors (Harmonic form) shown in connection with each Major Scale.

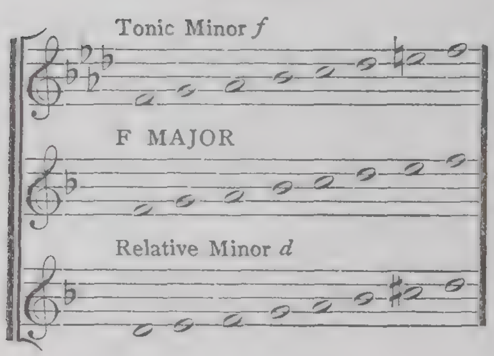
TABLE OF SCALES

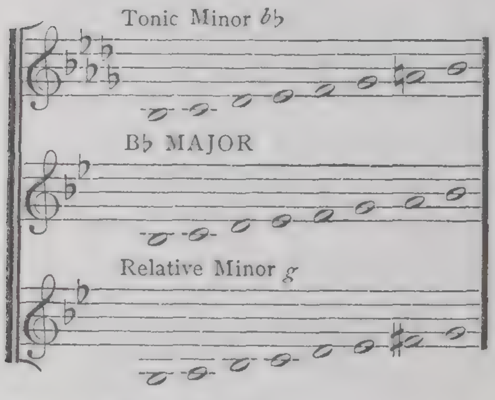
The Relative Minor has the same signature as the Major, and the same tones throughout with the exception of the seventh degree, which must be chromatically raised.

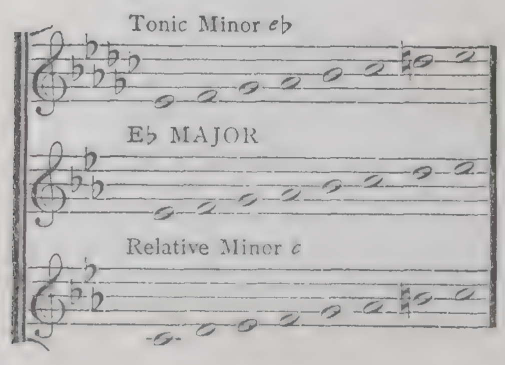
Each Tonic Minor is also the relative minor of another major scale, namely, that beginning on its third degree, and having the same signature.



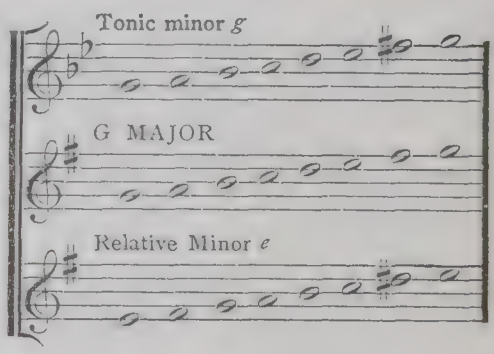
FLATS

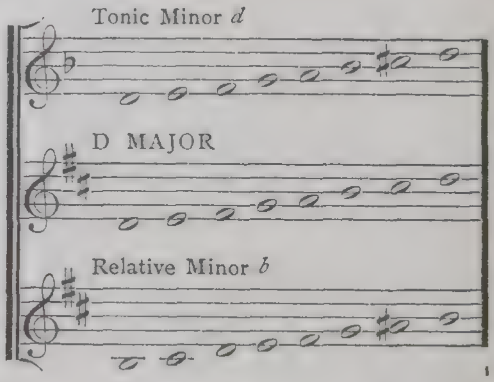


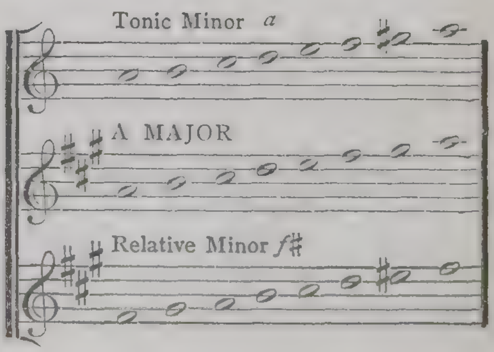


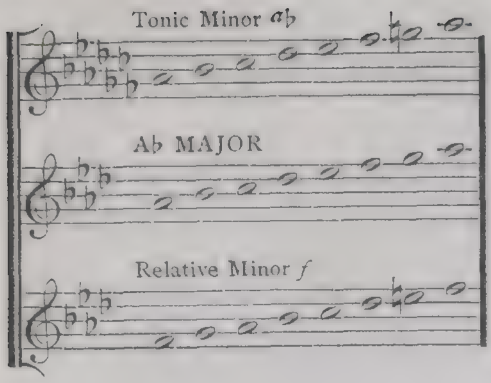


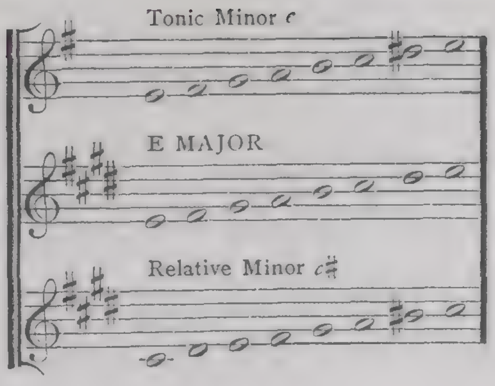
SHARPS

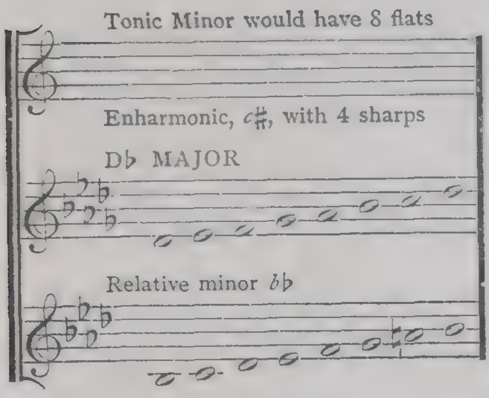


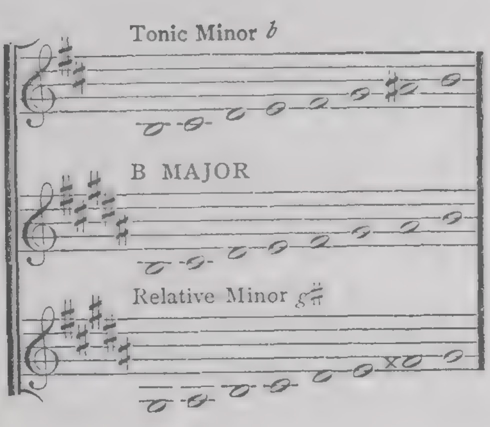


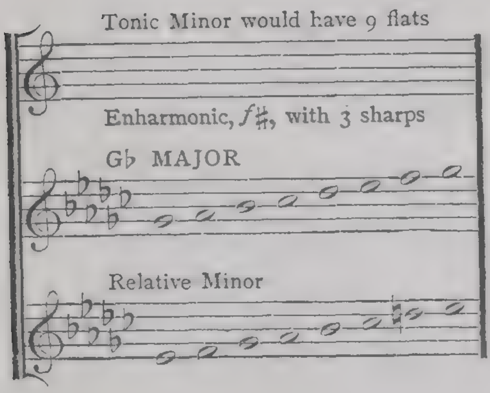


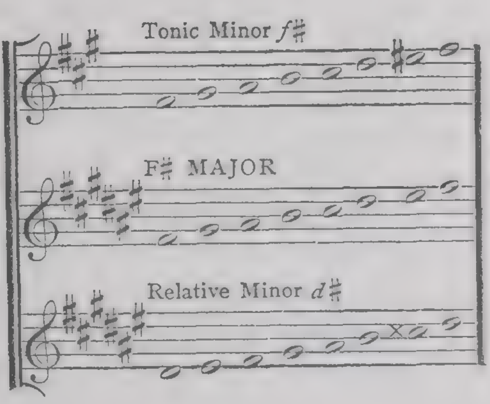

Tonic Minor *a*♭
A♭ MAJOR
Relative Minor *f*

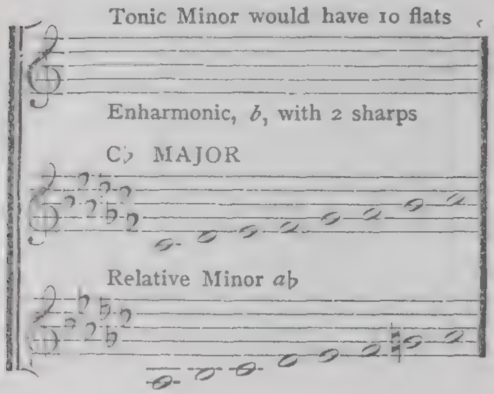

Tonic Minor *e*
E MAJOR
Relative Minor *c*♯

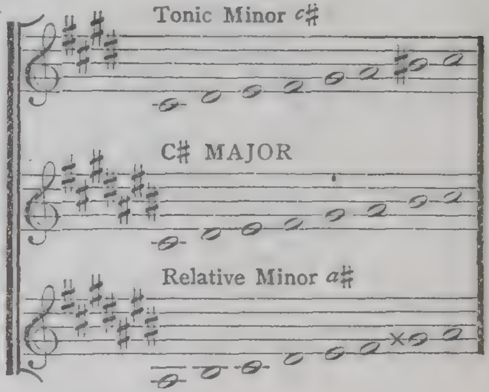

Tonic Minor would have 8 flats
Enharmonic, *c*♯, with 4 sharps
D♭ MAJOR
Relative minor *b*♭


Tonic Minor *b*
B MAJOR
Relative Minor *g*♯


Tonic Minor would have 9 flats
Enharmonic, *f*♯, with 3 sharps
G♭ MAJOR
Relative Minor


Tonic Minor *f*♯
F♯ MAJOR
Relative Minor *d*♯


Tonic Minor would have 10 flats
Enharmonic, *b*, with 2 sharps
C♭ MAJOR
Relative Minor *a*♭



NOTE. The use of any scale (major or minor) with more than six sharps or flats can be avoided by substituting its enharmonic equivalent; *e. g.*, G-sharp minor with five sharps instead of A-flat minor with seven flats; etc. (See Sec. 43.)

EXAMINATION QUESTIONS

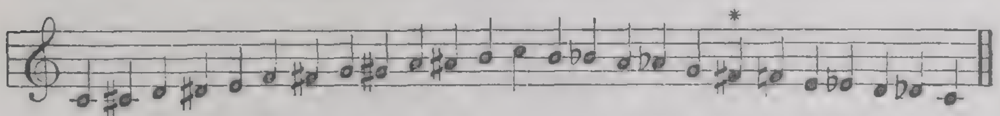
1. What two kinds of minor scale are in general use?
2. What is the relative minor of a major key?
3. What signature is used for the minor scale?
4. Give the notes of the relative minor to G, harmonic form.
5. The same, melodic form.
6. What is the relative major of F-sharp minor?
7. What causes the accidentals in minor scales?
8. What tones are the same in the minor and major scales on the same keynote?
9. What are these scales called with regard to each other?
10. Are they said to be related?
11. What is the characteristic feature about a minor scale that gives it the name "minor"?
12. What are Diatonic Scales?
13. What keys have two sharps, four flats, five sharps, and one flat?
14. Name the signatures of E minor, A minor and A-flat minor.
15. What is a Parallel Minor?
16. How is the term Mode used?

LESSON XII

SCALES (Continued)

Chromatic Scales

49. The **Chromatic Scale** moves by half-steps throughout, so that it has twelve tones to the octave, including all the keys of the keyboard. The intermediate tones not found in diatonic scales are shown by sharps and flats. Sharps are mostly used in ascending (the tendency being always to rise from a sharped note) and flats in descending (for the opposite reason). The notation depends to some extent, however, on the harmonization used for individual tones, the sharp fourth of a key (the characteristic tone of the next scale — that of the dominant) being so frequently met with that it is generally used in descending as well as ascending between IV and V of the scale.



50. The half-steps found in the diatonic scales are called Diatonic half-steps. They are between two different notes, as E — F. That between a note and the same sharped or flatted is called a **Chromatic Half-step**, as C — C♯. It is only found in the chromatic scale.

51. The scale degrees are named as follows, (placing the highest at the top): —

VIII	Octave	tonic in upper octave
VII	Leading tone . .	leads (by half-step) to tonic
VI	Submediant . .	middle note between keynote and subdominant
V	Dominant . . .	tone next in importance to tonic (5th above)
IV	Subdominant . .	dominant (5th) below keynote

III	Mediant . . .	middle note between I and V
II	Supertonic . . .	note above tonic, *super* = above
I	Tonic	keynote

EXAMINATION QUESTIONS

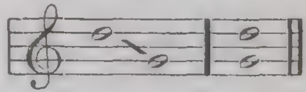
1. Define Chromatic Scale.
2. How many degrees to the octave has it?
3. How are the sharps and flats used?
4. Name an exception usually made, and state why.
5. What is the difference between a diatonic and a chromatic half-step?
6. Give the scale-degree names.

LESSON XIII

INTERVALS

52. **Interval** is the name of the distance between different pitches. It is reckoned alphabetically as to number of degrees — that is, from C to E above is a Third — C, D, E, being the letters forming it. F to B is a fourth (F, G, A, B).

Intervals are always reckoned upwards unless the contrary is stated. From D to G *below* would be a fifth, being thought of as "G to D" (G, A, B, C, D).



53. There are different kinds of thirds, sixths, etc. From C to D is a Second; and from E to F is a Second, but the former is greater than the latter, consisting of two half-steps.

54. The five kinds of intervals are Perfect, Major, Minor, Augmented and Diminished, and an interval is analysed *according to its relation to the major scale of the lower note.* In a major scale we call all the intervals Major (counting from the tonic) excepting the 4th, 5th, and octave, which we call Perfect.

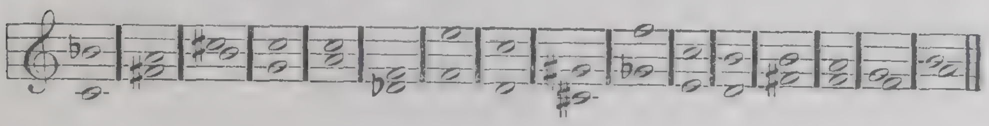
These tones are the three most important ones, it will be remembered — Tonic, Dominant and Subdominant. Thus, in every major scale the second is a Major Second (from the tonic); the third is a Major Third; the fourth is a Perfect Fourth; the fifth is a Perfect Fifth; the sixth and seventh, Major Sixth and Seventh; the octave Perfect.

55. **Major and Minor Intervals.** To find whether an interval — say a 6th — is **Major,** we compare it to the sixth of the major scale of the lower note. F to D is a major 6th because D is the sixth of the F scale. E to C is not a major 6th because C is not the 6th of the E scale. (C♯ is the major 6th, the scale of E having four sharps.) An interval a half-step less than a Major is called **Minor.**

56. Major and Minor Thirds and Sixths are called **Imperfect Concords.** Perfect intervals (4ths and 5ths) are called **Perfect Concords.** All other intervals are **Discords** — seconds, sevenths, and all diminished and augmented intervals. (Compare Sec. 90.) Technically, the **Prime** would be included among the perfect intervals, though it is not an actual interval unless augmented (see Sec. 57).

EXAMINATION QUESTIONS

1. What is an Interval?
2. How is the number of the interval calculated?
3. In what way is the *kind* of interval ascertained?
4. What are the four kinds?
5. Which intervals may be Major, and which may not?
6. When is an interval called Perfect?
7. When is an interval Minor?
8. What is a Prime?
9. Analyse these intervals: —



LESSON XIV

INTERVALS (Continued)

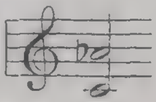
57. **Augmented and Diminished Intervals.** Intervals a half-step greater than Major are called Augmented. Intervals a half-step less than Minor are called Diminished. Perfect intervals (4ths, 5ths, and octaves) are never major or minor. Increased by a half-step they become Augmented, and decreased a half-step they become Diminished.

The following diagram shows all interval changes, increasing to the right and decreasing to the left: —

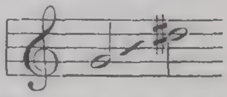
Increasing →

2ds, 3ds, 6ths, 7ths	DIM.	MINOR	MAJOR	AUG.
4ths, 5ths, 8ves	DIM.	PERFECT		AUG.

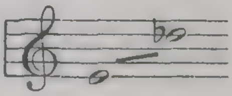
← Decreasing

58. **Examples.** What is C to A flat? 

By the letters, C, D, E, F, G, A, it is a **Sixth.** As the sixth of the C scale is A, A♭ is a half-step lower than the major sixth, and is a **Minor Sixth.**

What is G to D-sharp? 

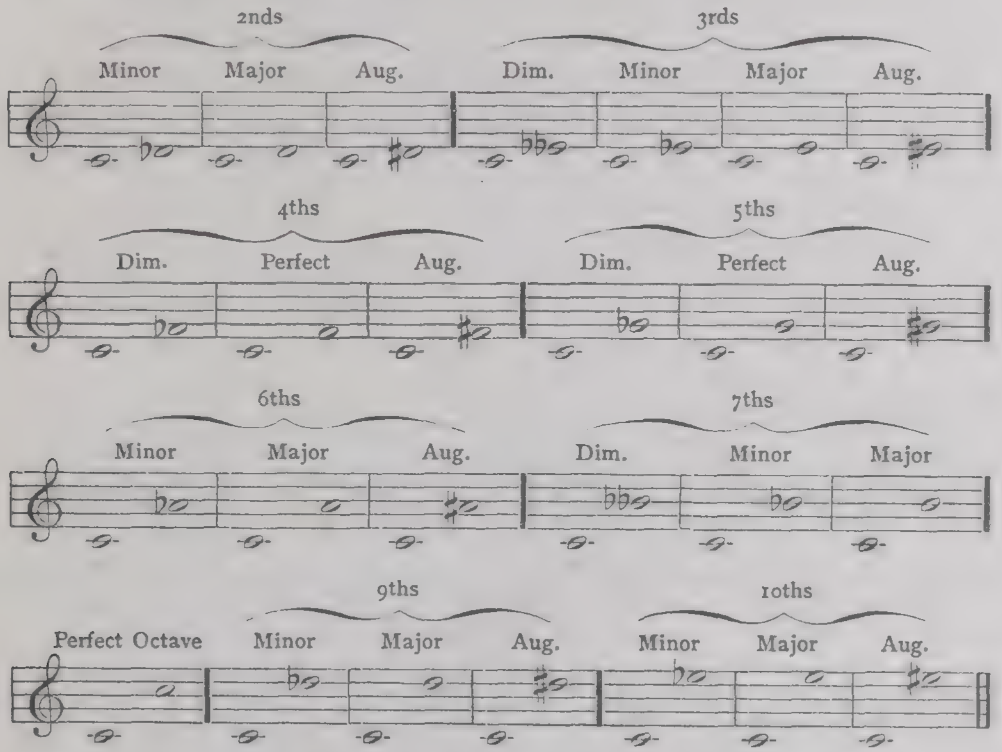
The letters, G, A, B, C, D, make it a 5th. The fifth of the G scale is D; D♯ being a half-step higher than the perfect fifth, the interval is a half-step greater, and is an **Augmented fifth.**

What is E to D-flat? 

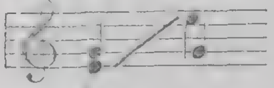
The letters make it a seventh. The seventh of the E scale is D♯; D-natural would be a minor seventh; D-flat a **Diminished Seventh.**

59. An interval is always calculated on its own notes alone, regardless of any key in which it may be found. E to C is the same interval in the key of C as it is in the key of F or G or any other — a minor sixth.

The following is a table of the principal intervals reckoned from C upwards. It must be remembered that they are not necessarily in the *key* of C, and that the table is illustrative rather than complete. A similar table can be constructed on the basis of any other note.



Intervals over an octave are frequently considered without reference to the octave; for instance, a 10th is harmonically a third, and is occasionally described as such, or as a **Compound** third.



60. **Inversion of Intervals.** When an interval is inverted, that is, the lower placed above the upper in another octave, the description of the new interval formed may be always found by subtracting the first number from 9, and reversing major and minor, or diminished and augmented. Perfect remains perfect. It is as if we revolved the diagram in Sec. 57 on a pivot in the center. "Augmented" would come where "Diminished" now is, but "Perfect" would remain in the same place. The above minor third becomes a major 6th: — 9–3 = 6, minor becomes major.

61. These abbreviations may be used to indicate the kinds of Intervals: — M = major, m = minor, P = perfect, A = augmented, D = diminished.

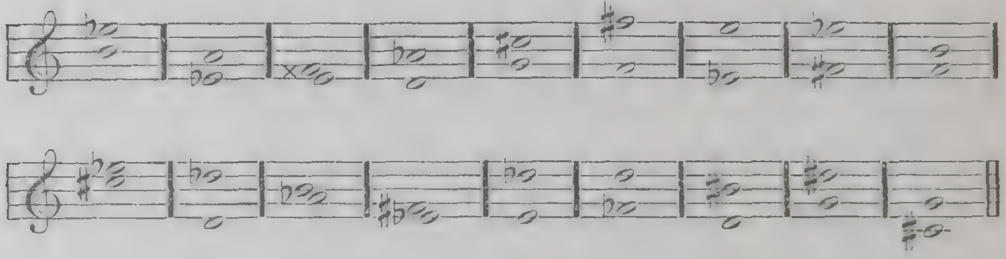
EXAMINATION QUESTIONS

1. What is an augmented interval?

2. What is a diminished interval?

3. How many half-steps less than an augmented sixth is a minor sixth?

4. Analyse these intervals: —



5. What is the inversion of an interval?

6. How is the numerical name of an inverted interval reckoned?

7. What change is made in the kind of interval by inversion?

8. Name the inversions of all the intervals of Question 9, Lesson XIII, and of Question 4, this Lesson.

LESSON XV

MARKS OF DYNAMICS, TEMPO, ETC.

62. Loudness or intensity of tone is indicated by the initial letters of Italian words, and by other signs. The most commonly used are: —

p — *piano* (pee-ah′-no), softly.
f — *forte* (for′-tay), loudly.
mf — *mezzo-forte* (met′-so-for-tay), rather loudly.
mp — *mezzo-piano* (met′-zo-pee-ah′-no), rather softly.
sf — *sforzando* (sfort-sahn′-do), strong accent.
pp — *pianissimo* (pee-ah-nees′-see-mo), very softly.
ff — *fortissimo* (for-tees′-see-moh), very loudly.
cresc. or < — *crescendo* (cray-shen′-doh), increasing, gradually louder.
dim. or > — *diminuendo* (dee-mee-noo-en′-doh), diminishing, gradually softer.

63. The first two Italian words on this list, "Piano-forte," gave the piano its name when first invented, because the instrument could produce tones from "soft to loud."

64. **Tempo.** The speed at which a piece should be played is called the *tempo*, and is shown by Italian words (generally) at the beginning. Some of these are: —

Adagio (ah-dah′-jeoh), slow.
Andante (ahn-dahn′-tay), rather slow.
Moderato (mo-day-rah′-toh), in moderate *tempo*.
Allegro (ahl-lay′-gro), very lively.
Allegretto (ahl-lay-gret′-toh) lively, but not as fast as *allegro*.
Vivace (vee-vah′-chay), fast.
Presto (pres′-toh), very fast.

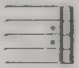
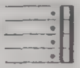
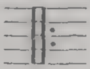
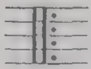
65. Words used in connection with the *tempo* and modifying it, are: —

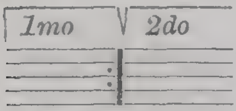
Accel. (*accelerando*) ah-tschel-eh-rahn′-doh), becoming faster.
Rit. (*ritardando*) (ree-tah-dan′-doh)
Riten. (*ritenuto*) (ree-tay-noo′-toh) } becoming slower.
Rall. (*rallentando*) (rahl-lain-tahn′-doh)
A tempo (ah-tem′-poh), back to the regular *tempo* (used after *accel.*, *rit.*, etc.)
Con (kon), with (*con espressione* — with expression).
Senza, without
Meno (may′-noh), less.
Assai (ah-sah′-ee), very.
Più (pee′-oo), more.
Poco a poco (poh′-koh-ah-poh′-koh), little by little.

66. **The Metronome.** The *tempo* markings give only approximate and comparative speed, one might say the spirit or manner, of performance. The **Metronome** is a clock-like mechanism which ticks so many beats to the minute, and therefore gives exact speed. A mark "♩ = 76" at the beginning of a composition means that the metronome's indicator must be set to 76, and it will then tick at the rate of 76 to the minute, each tick representing one quarter-note in the counting or playing. A very strict adherence to mechanical exactness would be contrary to musical expression, but the use of the metronome is of great value in practice, and also in indicating the general rate of speed.

67. A few other markings are: —

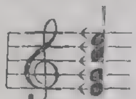
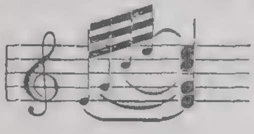
Cantabile (kahn-tah-be-lay), in a singing style.
Legato (lay-gah′-toh), closely connected (the opposite of *staccato*).
D. C. (*Da Capo*) (dah-kah′-poh), from the beginning.
Staccato (stak-kah′-toh), disconnecting the tones.
Marcato (mah-kah-toh), with emphasis.
Fine (fee′-nay), ending.

68. **A Double Bar** is placed at the end of a composition, and at an important division between parts. The double bar with dots  or  means the section is to be repeated, either from the beginning or from some point, not so far back, where there is another double bar with the dots on the right-hand side: —  or . After a Repeat it may be necessary to omit the last few measures leading to a repetition and substitute others, which is indicated by these marks: —

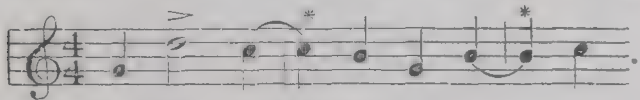


. The part marked "*1mo*," or sometimes only "*1*," is left out after the repetition.

69. Other signs of repetition are "*D.C.*" (in the list above) and "*D.S.*," *Dal Segno*, (dahl sayn′-yo). The last means "go back to the Sign," and the sign, placed further back, is 𝄋.

70. The **Arpeggio**, (arr-pay′-je-oh) or **Arpeggiando** (arr-pay-je-ahn′-doh) sign,  signifies that the notes should be struck in rapid succession (from the bottom, upward) and held; instead of all simultaneously: —  It means "like a harp."

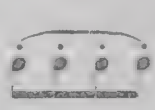
71. **Accent.** The principal accent is located by the bars (Sec. 19). Signs indicating special accents are > ∧ *sf fz* – and ‾̣. When the regular accent of the rhythm is displaced by means of special accents, or tied notes, we have **Syncopation**, as

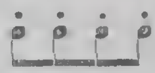


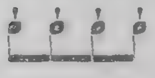
. Here the normal accents at * are obliterated.

72. The **Slur** is in appearance the same as a Tie, but being over notes (two or more) of different pitch, means that the tones are to be connected as much as possible in performance; in other words, played legato.

73. **Staccato** is shown in three degrees,

 or semi-staccato, slightly disconnected.

 decidedly disconnected.

 the notes cut quite short.

74. The **Fermata** (fair-mah′-tah) or **Hold,** 𝄐 over a note, chord or rest, extends the duration of it an indefinite period, at the taste of the performer. Placed over a double bar, it generally indicates the end of the composition, especially after a Repeat.

75. The sign *8va*............: over notes or chords means they are to be played an octave higher. *Loco* (loh′-koh) means, "play them as written."

76. The **Pedals** of a piano are often called "soft and loud pedals" (left and right side). The first is correct but the second incorrect. It is the "Sustaining pedal," allowing the tones to continue sounding after the hands are taken from the keys. The loudness depends upon whether the keys are struck forcibly or not. The Sustaining pedal is very often used in the softest music. To loud music it adds a resonance and sonority, as many strings of the instrument, not actually struck, vibrate slightly in sympathy with those that are.

The third pedal found on modern grand pianos is either for the purpose of raising the lower section of the dampers only; or for holding up such dampers as are already being held off the strings by the player at the moment of its operation, with no effect on what is played afterwards. The latter is called the Sostenuto Pedal. Another use of a third pedal (on some upright pianos) is that of interposing a piece of felt between the hammers and the strings, thereby greatly deadening the tone.

EXAMINATION QUESTIONS

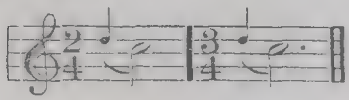
1. Mention some of the markings indicating "soft" in music.
2. Mention some of the markings indicating "loud" in music.
3. What signs show changes from one to the other?
4. Give some markings used for accent.
5. What accent is always understood without special marking?
6. From what is the full name of the piano derived?
7. Give some words indicating the tempo of a performance.
8. What terms modifying the tempo are used?
9. How may the exact speed of performance be indicated? Explain fully.
10. What signs indicate repetition?
11. What is a slur and how does it differ from a tie?
12. What is the sign 𝄐?
13. For what purpose are the pedals of a piano?
14. Explain Arpeggio and give the sign for same.
15. Define and illustrate Syncopation.
16. Explain the Double Bar.

LESSON XVI

ORNAMENTS

77. **Ornaments or Grace Notes** are very much less used now than in the older music. They are melodic embellishments, and modern composers nearly always write out all desired effects in the usual notation; but the following signs should be understood when met with in the works of Bach, Mozart, etc. The Appoggiatura, Acciaccatura, the Trill, and double and triple Grace Notes are still commonly used.

78. **Appoggiatura** (ahp-pod'-jah-too-rah.) (Long Appoggiatura.)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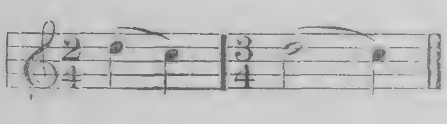
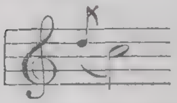


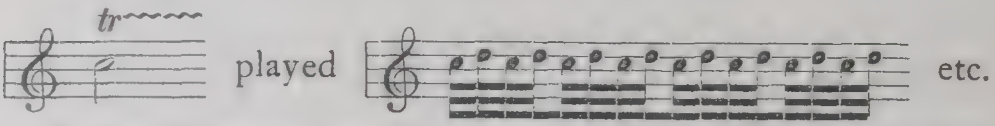
This is an accented ornament, and though printed with a small note, it takes half or more than half of the time of the principal note.

79. **Acciaccatura** (aht-chahk′-kah-too-rah). (Short Appoggiatura.)

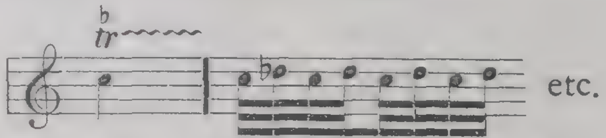


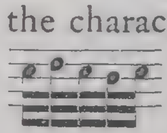
Played very quickly, with no accent, and taking no appreciable time from the principal note. (It is a small eighth-note, with a line through the "flag.")

80. **Trill.**

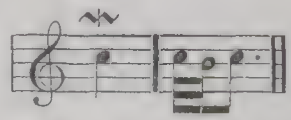


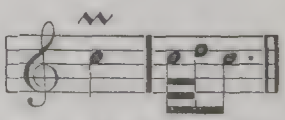
A rapid alternation of the principal with the next note above. If the note above is to be some other than the scale note, it is shown by a chromatic sign,



The rapidity of the trill, that is, the kind of notes used, depends greatly upon the character of the music. It is usually ended with a Turn  (See Sec. 82.) The Trill is also called a Shake.

81. **Mordent.** Two embellishments formed by playing the principal note and then the note below (or above) very quickly, returning to the principal and holding it for the remainder of its length: —

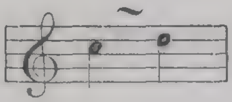
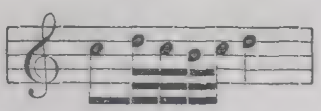


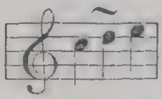
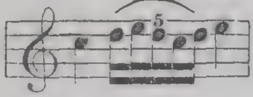


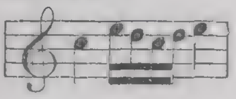
The second is generally called the **Inverted Mordent,** perhaps because it is the reverse of the first and more commonly used embellishment. According to the derivation of the name

" Mordent," "a fragment of a trill," it would appear that the form with the note above should be the Mordent, and that with the line through it the inversion, though all authorities do not agree on this.

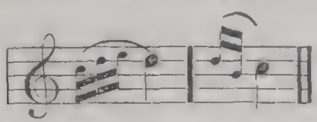
82. **Turn.**

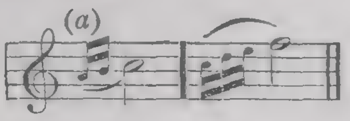
Between notes  played 

On a note  played 

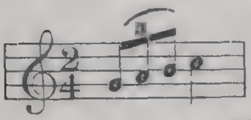
or 

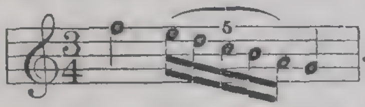
83. **Double and Triple Grace Notes. Slide.**

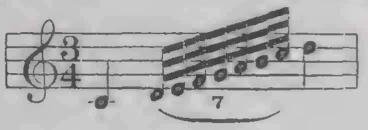




Played quickly, before the accent. When the Grace notes run in a direct line to the principal, it is called a Slide, as at (*a*).

84. **Irregular Groups of Notes.** Instead of the time value of a note being divided into halves or quarters, it is sometimes divided into three, five, or other irregular number. The special division is shown by a figure over the group, as 

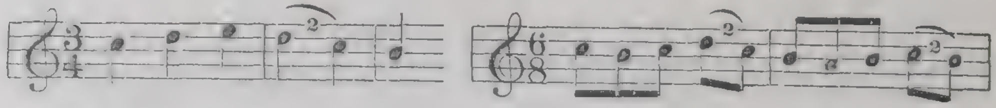
and are played in the time of the usual two: or 

. Here the three eighths make a **Triplet.** The group of five takes the place of a regular group of four. We may also have six or seven in a group, equaling one longer note. Five or six are supposed to be in place of four, and are therefore shown as sixteenth notes, but seven would be nearer eight, and so would be properly notated as thirty-second notes: — 

Such a group

is, however, often written in sixteenths, that is, seven in place of four sixteenths instead of seven in place of eight thirty-seconds. There is no difference in performance.

Two notes may be used in place of three, as: —



The names Duplet and Sextolet are sometimes applied to the two- and six-groups.

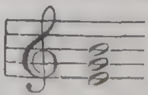
EXAMINATION QUESTIONS

1. What ornaments in music are still commonly used?
2. How are other melodic embellishments usually shown in modern music?
3. Compare and explain Appoggiatura and Acciaccatura.
4. Define Turn and Trill.
5. Explain Double Grace notes and Mordent.
6. What are Triplets? and what other irregular groups are used?
7. What is a Shake?

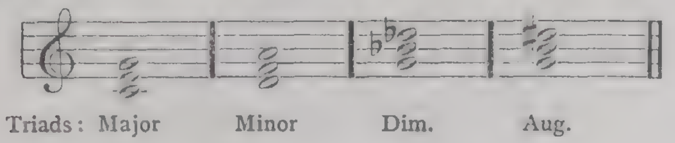
LESSON XVII

CHORDS

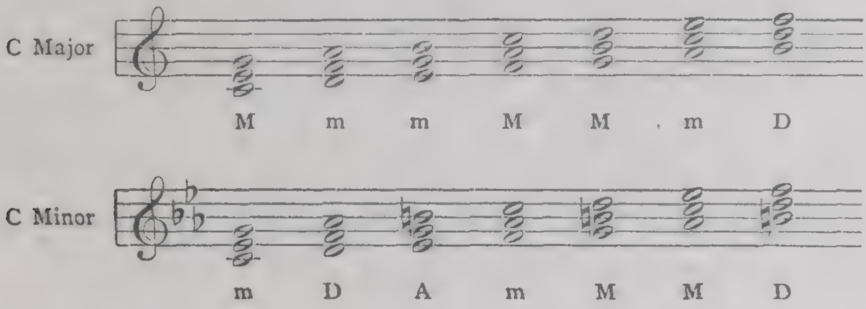
85. **Chords** are formed by the combination of two or more different tones. (Two tones would make an incomplete chord.) The study of chords is called **Harmony.**

86. A **Triad** consists of three notes, a **Fundamental** or **Root**, a **Third**, and a **Fifth**: —  If the fifth is perfect (see Sec. 54) the triad is also called a **Common Chord**, and is major or minor according to the third. The chord above is minor — a "Minor Triad" or a "Minor Common

Chord" on E. If a triad has an augmented or diminished fifth, it is called an **Augmented** or **Diminished Triad**. The former has a major third, and the latter a minor third: —



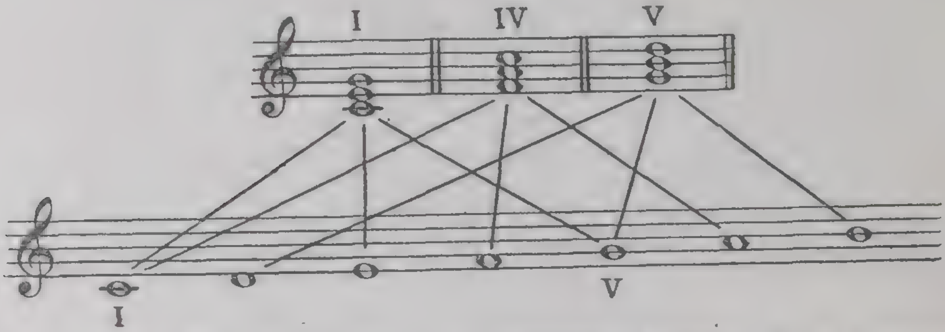
87. The triads diatonic to any key, that is, constructed entirely from the diatonic scale, are mostly major and minor; but there is one diminished triad in the major key, and in the minor (the harmonic minor being used for harmony, as its name implies) there are two diminished and one augmented. The signs given in Sec. 61 are used below to indicate the different kinds: —

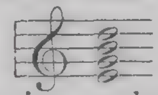


To make comparison easy, we have taken the Tonic Major and Minor (Sec. 48). In two places the chords are the same in both keys — Major on the dominant, and Diminished on the leading tone.

88. The triads on the three principal scale degrees are called **Primary Triads**, and the others **Secondary Triads**. As the primary triads contain among them all the notes of the scale, any diatonic melody may be harmonized with these three chords alone, and many simple compositions — folk-songs, for instance — are so harmonized.

The following diagram shows how every note of a scale is found in one, at least, of the three primary triads. The tonic and dominant are each found in two:—

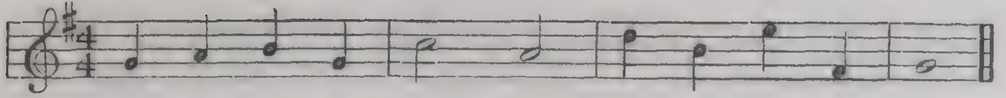


89. Chords of four notes are **Seventh Chords** (or Chords of the Seventh)  and there are many different kinds, the construction and use of which is fully taught in the more detailed study of Harmony.

90. Triads with perfect fifths are **Concords.** All other chords are classed as **Discords,** and depend upon progression to something else for satisfactory effect.

EXAMINATION QUESTIONS

1. How is a chord formed?
2. What is a Triad?
3. What is a Common Chord?
4. What kinds of triads are there?
5. Name some positions in the major and minor keys in which the Major Triad is found.
6. On what degrees of major and minor scales are Minor Triads found?
7. Where do we find the Diminished Triad?
8. Where is the Augmented Triad found?
9. Indicate under the notes of the following melody by means of Roman numerals, the Primary Triads of the key in which each may be found.



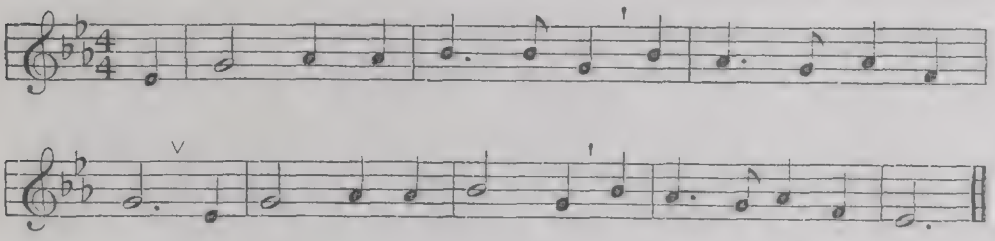
10. What is a Chord of the Seventh?

11. What are Concords, and what are Discords?

LESSON XVIII

FORM

91. **Form** is the plan upon which a musical composition is constructed. The division of melody into measures was explained in Lesson IV, Sec. 19. In order to form longer divisions of music, these measures are taken in groups of two, four and eight, making **Sections, Phrases** and **Periods.** A number of periods will then constitute a whole composition, or a Part. Notice the air of "Home, Sweet Home." The first period is: —



It divides into two four-measure Phrases, and these are again divisable, though less distinctly, into two-measure Sections. The division is not at the bar line, as each section begins on a fourth beat and ends on a third; that is, the melody begins with an unaccented note, just as the word "about" begins with an unaccented syllable.

92. These rhythmical divisions are natural to the music, and may be found in most well-known and simple melodies. There are exceptional rhythms and period-lengths, and the

periods and larger divisions are put together in many different ways, making the different kinds of compositions, and the many varieties of each.

EXAMINATION QUESTIONS

1. What is Form in music?
2. What other divisions are there besides the Measure?
3. Name the ordinary length of each.
4. How is a whole composition made up of these?
5. Analyse the first eight measures of several simple and familiar melodies.

LESSON XIX

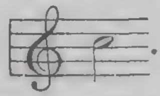
ACOUSTICS

93. **Sounds** of all kinds are caused by **Vibration.** Vibration is a rapid to-and-fro movement, which can be sometimes seen, as, for instance, the vibration of a springboard after a diver jumps off. To produce **Tone**, vibration must reach a certain rapidity, as well as being regular. The springboard appears to have regular vibration, but not rapid enough to produce tone. A tuning fork is a familiar instance of vibration producing tone. With a large fork, this also may be seen.

Vibration is passed along by the air to our ears.

94. The lowest C of the Piano requires a vibration of the string of about 32 per second. Any vibration of 32 per second will produce a tone of that same pitch. (A vibration is an oscillation in one direction and return.) Double the vibrations always makes an octave higher. The tone of Middle C is caused by the strings struck by the hammer vibrating about 258 times per second. Doubling for octaves higher, we find that the top note of the keyboard (C) has a vibration number of over 4000 per second.

95. With strings, vibration is made more rapid and, hence, the pitch higher by (1) tightening the string (as in tuning up a violin or a guitar, etc.); by (2) shortening the string (which the violinist does by "stopping" with the fingers of the left hand while playing).

96. The tone of organ pipes, orchestral wind instruments, tin whistles, etc., is produced chiefly by the air inside the pipe. A large and long pipe gives a deep tone. Take a cardboard tube open at both ends, and blow across one end. A tone will be heard, whose pitch depends on the length of the tube. A tube about two feet long will give middle C; one of half that length, 12 inches, will give the C above, . Half the length gives twice the vibration, and consequently one octave higher.

97. When a string is sounding, if it be touched lightly, right in the middle, the tone will immediately jump an octave; for each half of the string will continue to vibrate, and here again half the length gives an octave higher. This is called a **Harmonic Tone.** There are many others besides the octave.

98. Vibration which is only partially regular gives a mixed tone of uncertain pitch, as some bells, gong, cymbals. On the other hand, a tuning fork vibrates with such perfect regularity that it gives a practically pure tone.

99. **Entire range of tone.** The piano keyboard represents approximately the compass of the sounds used in music, the pipe organ going somewhat lower, and the piccolo a little higher.

100. The lowest audible tones are those from 12 to 16 vibrations per second. Fewer than these begin to be perceptible as separate pulsations instead of continuous tone.

101. The highest limits of pitch depend on the sensitiveness of the ear. Though the highest tone produced by musical

instruments is one of only a little over 4000 vibrations, experiments with tuning forks, small pipes, and steel bars have produced distinct tones up to about 30,000, or nearly three octaves higher. Thus we may say that eleven octaves constitutes the entire range of tone.

EXAMINATION QUESTIONS

1. What causes Sound?
2. How is Tone distinguished from other sounds?
3. What causes the difference of an octave beween two tones?
4. Name the vibrations of any tone that you can locate by the staff or the keyboard.
5. What are the vibrations of the lowest and highest tones perceptible to the ordinary hearer?
6. What instrument has the lowest tones, piano or organ?
7. What will raise the pitch of a violin string?
8. How does the comparative length of a pipe affect the vibrations?
9. Describe one of the Harmonic Tones.
10. What causes pure and impure tone? Give examples.
11. About what is the entire range of tone?

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H. J. WRIGHTSON